

International Conference and Exhibition on Floating solar PV on dam reservoirs and solar-hydro hybridization

ON LINE
7-8 July 2021

Organized by Aqua~Media International with
ICOLD's Technical Committee on Emerging Challenges & Solutions

A report issued in 2020 by the US Dept of Energy predicts that a combination of floating solar panels and hydropower/dam reservoirs could produce up to 40 per cent of the world's electricity, and many countries have begun to exploit some of the vast global potential over the past five years. A recent World Bank market report highlights the rapid growth in this technology.

Reservoirs are the natural companions to solar PV, as they provide the space on which the panels can be installed, and they may also provide additional benefits, such as cooling of the panels, and providing storage for the intermittent solar electricity. Many of the developing countries of Africa and Asia, with hydro reservoirs in operation, and abundant sunshine, could especially benefit from this technology.

The International Commission on Large Dams (ICOLD), through its Technical Committee on Emerging Challenges and Solutions, has begun work on this topic, and intends to publish a Technical Bulletin next year.

Special sessions had been planned by the Technical Committee, to be integrated into Aqua-Media's AFRICA 2021 conference, which is now postponed until next year. Therefore, we are pleased to be working together with the Committee to develop the planned session into a two-day on-line conference in July.

This two-day event plans to bring together (virtually) owners and operators, researchers, consultants, contractors and suppliers (from the hydro and PV industries), financiers, and in particular, those planning to embark on a programme of floating solar PV (FPV) developments.

Speakers will include operators and consultants who already have experience of developing floating solar installations, in Europe, Asia, Africa and the Americas, and they will share knowledge with others wishing to learn about technical, environmental, risk management, and economic/financial aspects of FPV schemes. Everything from global benefits, to the practicalities of mooring systems for solar panels, will be covered in presentations and discussions.

Chairman of the ICOLD Technical Committee on Emerging Challenges and Solutions, Luc Deroo of France, will be overall chair of the programme, which will comprise up to 10 presentations by international experts on each morning, followed by panel discussions on four main topics during each afternoon.



Programme Outline

DAY 1 - FPV on dam reservoirs: Concept, global potential and design issues

Morning presentations

- Floating photovoltaic on dam reservoirs (FPV-DR): Issues and questions – *L. Deroo, Chair of ICOLD's Technical Committee on Emerging Technology and Challenges, and ISL, France*
- World Bank perspective on floating solar panels on reservoirs – *B. Brunes, The World Bank*
- Experience of FPV on large reservoirs, and challenges – *O. Philippart, Ciel et Terre International, France*
- The design of floating structures – *A. Hage, DN&T, Belgium*
- Design and analysis of FPV on reservoirs – *Huang Chunlin/Feng Weijiang, PowerChina, China (to be confirmed)*
- FPV: a designer's perspective – *M. Bernicot, ISL, France*
- The design of FPV moorings – *F. Gorintin, Solar PV Lead Engineer, Innosea, France*
- The accident at Yamakura, Japan – *J. Fukuwatari, ICOLD Technical Committee T, Japan (to be confirmed)*

(Additional contributions will be announced shortly)

Afternoon panel discussions

Discussion topic 1: Potential for FPV-DR

The theoretical potential is huge. Speakers will discuss the real potential available and realistic to develop, and variations in the potential in different parts of the world.

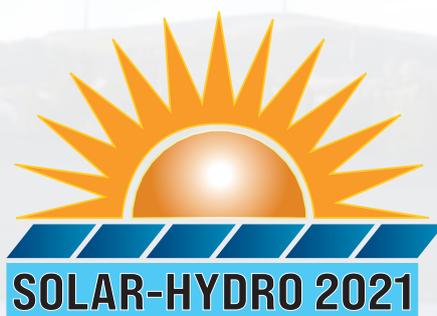
- What is the current FPV-DR situation: potential, projects, challenges, ...?
- How does FPV-DR compare with classical PV, from a developer's point of view (CAPEX, OPEX, efficiency, ...)?

Discussion topic 2: Design issues / Risk analysis and management

Extreme events (waves, wind and others) will be discussed in relation to floating solar panels. Large dam reservoirs can generate high waves, induced by strong wind events. This has caused already failures of floating solar panels (for example on the Yamakura reservoir).

- How can waves and strong winds be robustly modelled?
- Options to withstand high waves (1.5+m) and very strong winds (120+ km/h)?
- Have other extreme events been considered at existing projects?
- Risk analysis / Risk management: are FPV an additional potential failure mode to be considered? How are the specific risks assessed and how are they managed?
- Moorings: Large dam reservoirs can be very deep, and may have large level variations. What are the best mooring options in these conditions?

(Panellists to be announced)



DAY 2 - Case studies, hybridization options and E&S issues

Morning presentations

- Perspective from UEGCL – *M. Mukulu, UEGCL, Uganda*
 - Status in Burkina Faso and neighbouring countries – *A. Nombre, IFEC, Burkina Faso*
 - Update on 2 FPVs in Indonesia – *A. Firman, Vice-Chairman, INACOLD, Indonesia*
 - Floating solar powerplants in Vietnam – *M. Ho Ta Khanh, Consultant, Vietnam*
 - Nam Theun 2 (Laos) and Lazer (France) projects – *A. Rousselin, EDF-CIH, France*
 - Alqueva and Alto Rabago, Portugal – *F. Guerra, EDP, Portugal*
 - Solar, hydro and pumping: a mix for tomorrow – *F. Lempérière, HydroCoop, France*
- (Additional papers to be invited, from India, Korea, Ghana, Brazil and USA)**

Afternoon panel discussions

Discussion topic 3: Coupling: solar-hydro hybridization

Options and benefits: Several kinds of hybrid project can be contemplated, with very varied options for hybridization, and hence very different benefits, either for energy production or water resources preservation.

- What are the options for hybridization, and what are the possible benefits?
- Which case studies serve as the most significant examples?

Discussion topic 4: E&S issues

The panellists will debate the main E&S challenges related to FPV on dam reservoirs, and how to design a FPV powerplant that minimizes these issues and optimizes E&S benefits. Solar PV has an impact on the physical, chemical and biological cycles in the reservoir, so the first discussion topic will be impacts on biodiversity:

- Can more be done to delineate these impacts precisely?
- Do we have data from projects where large parts of a water body have been covered?

Impacts on fisheries:

- Do we have data, where impact on fisheries has been appraised, or measured?

Life cycle analysis:

- How life cycle analysis (LCA) of a project might help when comparing options and projects
- Are data available from past projects, where LCA of FPV has been derived?

(Panellists to be announced)

**Updates will be published regularly at: www.hydropower-dams.com
Contact: solar-hydro2021@hydropower-dams.com**